could surface repressed material and permit greater transference of vital information from patient to psychiatrist. They allowed that one LSD session could replace months of work using the then current techniques.[6]

The British found LSD had great value in dealing with psychopaths. The Canadian Psychiatric Association Journal reported good results with LSD in reversing frigidity and sexual aberrations. American mental hospitals reported that treatment of schizophrenic children with LSD met with some success when all other known methods had failed. Several well known psychiatrists reported that selective, controlled use of LSD enhanced creativity. Several medical hospitals conducted numerous trials with LSD on terminal diseased patients with profound favorable changes in attitude, where pain killers had failed.[6]

Amongst the enthusiasm of a growing use for LSD in the civilian medical community, the military scientific community was continuing its efforts to promote a "humane weapon system" as an alternative to mass destruction by conventional or atomic means.[8,9,10] These forces were joined by the ever present need of the intelligence community to determine an enemy's capabilities for using psychochemical agents as a weapon against our national security.

In what was an apparent effort to pull these forces together, the Department of Defense appointed an "Ad Hoc Study Group on Psychochemical Agents [the Wolff Committee]" in June of 1955. The actions and conclusions of this group will be discussed later in this report. However, it is important to note that at the time the study group met there were at least one hundred major reports available regarding experiments with LSD and other comparable psychochemical substances.[8]

FOOTNOTES

CHAPTER II

1. Report entitled, "Selective Malfunctioning of Human Machine, New Horizons in Chemical Warfare," by LTC Douglas Lindsey, November 1959.

2. Edgewood Arsenal Technical Report EATR4210, "The Search for Toxic Chemical Agents," by Dr. Benjamin Witten, November 1969.

3. Article in Scientific American titled, "The Hallucinogenic Drugs," published April 1964.

4. Report entitled, "Psychochemical Warfare, A New Concept of War," by Dr. L. Wilson Greene, August 1949.

5. American Journal of Psychiatry, Volume 108, July 1951-June 1952.

6. Book titled, "The Drug Scene," by Dr. Donald B. Louria, 1968.

7. Report entitled, "The Role of Incapacitating Agents in Warfare, Historical Review," by W. Bobo and B. Witten, dated August 1965.

8. Report of the Ad Hoc Study Group on Psychochemical Agents (Wolff Report), published November 1955.

9. Article entitled, "The Critical Importance of CBR in National Defense," by MG Marshall Stubbs, January 1961.

10. Readers Digest article, "Let's Face the Truth About Gas and Germ Weapons," published in August 1960.

11. Minutes of "First Psychochemical Conference," Army Chemical Center, MD, published by Dr. Amedeo Marrazzi, 12 May 1954.

12. Letter from Army Materiel Command, subject: Hallucinogenic Compounds, dated 22 July 1975.

CHAPTER III

THE THREAT

General

The purpose of this chapter is to provide a rationale for the initiation of research of incapacitating chemical agents.

To understand and evaluate the decisions which resulted in the U.S. Army's entry into and the subsequent proliferation of chemical agent research during the 1950s and early 1960s, it is necessary to first examine the "threat" to the free world as it was perceived at that time. The perceptions must be viewed in the context of the events of the time and the then attitudes of the American people. Of particular importance in this regard was the intensified struggle between the free world and communist world and the generally accepted thesis that supremacy must be maintained in all matters which involved the communist bloc.

At the close of World War II, America was accepted as the only viable major power in the world.[1] In two world wars the seemingly unlimited capacity of America to produce weapons, food, and transport had in each case prevailed over the ingenious new weapons and tactics employed against us. This, and our status as the world power, undoubtedly served to assuage the American people as the demilitarization of our industrial might proceeded and the country returned to a period of normalcy.[2,23] However, national strategists recognized that regardless of the world's horror of war and the expressed desire for peace, war had become more total than ever, since technological advances in warfare assured that in the future entire populations could be affected directly and quickly.[3,6] It was also recognized that although the atomic bomb was credited with destroying Japan's will to fight, 75 percent of the total bombs dropped on Japan's war making capability were chemical incendiaries. With this in mind, it was reasonable to predict that in future strategic planning chemical and biological (CB) warfare measures would join with radiological warfare as matters of primary consideration. However, for a brief period the CB warfare program was dormant in the U.S.[26,20]

The close of the 1940s revealed a new facet of the communist revolutionary movement, which added a new dimension to international conflict and a new term to our lexicon--"Cold War." A United States National Policy of Containment was formulated, and from this new challenges were presented. Even when major conventional forces were not engaged in open conflict, the cold war tactics of propaganda, subversion, guerrilla warfare, and liberation movements or uprisings were being employed. Once it became apparent that the atomic bomb was no longer an American monopoly, it was inevitable that new strategic assessments would have to be made. Rational men obviously would look for other ways to attain national objectives; methods which would not include the strong possibility of national suicide or general war.[4,5]

In early 1951 the U.S. intelligence community learned that Russia was experimenting with a psychotropic drug called "ketjabung"; which, when administered to an unsuspecting victim, was alleged to enable an individual to exercise external subservient control of that person without his victim's subsequent awareness that he had been exploited. Use of this material in interrogation was viewed as a potential threat to our national security.[6] Shortly after U.S. intelligence interest was aroused, two Soviet Bloc agents were seized in West Germany. They were carrying syrettes of a substance which supposedly would lessen an individual's ability to resist the orders of his captors. The captured substance was furnished to chemical laboratories in Europe and the U.S.; however, the exact identity could not be determined, although it was found to be an alkaloid compound. This discovery, and its potential, became more alarming when in the fall of 1951 a prominent doctor from Harvard Medical School reported to the Army Surgeon General that he had learned, during a visit to Europe, that several countries were experimenting with LSD and studying its possible military use.[24] This information, coupled with earlier intelligence findings, heightened the suspicion that the military application of psychochemical drugs was the object of intensive chemical research by our potential enemies.

USSR - Research and Development

Chemical warfare was not new to the USSR. In 1888 Czarist Russia was among the first of the major powers to recognize the military significance of chemical warfare, particularly mustard gas. In 1899, at The Hague, Czar Nicholas made the unprecedented announcement of the possible employment of projectiles filled with "deleterious gases." The czar's statement created enough concern that the Assembly outlawed the use of chemical filled projectiles.[25] This was the only chemical warfare prohibition to come out of The Hague in 1899. In 1914 the USSR established a chemical warfare research and development capability, three full years ahead of the United States.[7] In 1915 Russia, as with the other Allies, was initially unprepared for the Germans' use of chemical weapons. However, Russia's earlier research was evident when she retaliated, within two months, using mustard, chlorine, and phosgene gases; she was the first of the Allies to do so. By the beginning of World War II Russia was believed to have larger chemical agent stockpiles than any other nation. Some hint of their interest in research in chemical warfare agents was reflected in 1943 when M. I. Kabachnik was awarded the Stalin Prize, 1st Class, for "development of a chemical substance of great significance." German intelligence documents captured after World War II disclosed that the Germans credited

Russia with being fully prepared for extensive chemical warfare, and, in fact, had developed a class of toxic agents not then known to Germany.[25] Some credence is provided to this belief by noting the use Russia made of Dr. Von Bock after World War II. Dr. Von Bock was the production manager of the German Tabun gas plant that was transferred to Russia at the end of the war. Although Dr. Von Bock was captured and taken to Russia along with the plant, he was not employed in the reassemblage of the plant or subsequent chemical agent production. U.S. intelligence considered this as evidence that Russia already possessed ample expertise of her own.[24]

By comparison, in the early 1950s the United States was far behind the USSR in the research and development of chemical warfare agents.[17] In 1952 the Central Intelligence Agency disclosed that the Soviet Bloc had made large purchases of ergot (from which LSD is derived). Also, during this same timeframe the Polish radio urged the people to collect ergot because considerable quantities were needed.[25]

Although American interest in new chemical warfare agents, to include psychochemicals, was intensified during the Korean War, priorities for research and development efforts were necessarily placed on development, improvement, and production of weapons of known immediate value to the war effort as opposed to extensive research of new agents. Thus, chemical research and development efforts were directed primarily toward irritants, smoke, incendiaries, and napalm.[27d] Nevertheless, the USSR and her satellites continuously charged the United States with the manufacture and use of biological warfare agents.[23] These allegations were accompanied by massive propaganda efforts and contrived evidence. Another startling event of the Korean War was the belief that the communists had used drugs in connection with the "brainwashing" of our POWs.[27f] In this regard there was a general belief that the drugs in question were of the psychochemical category. These events, when coupled with our lack of research and development effort in new chemical and biological warfare agents, magnified our comparative backwardness in the field. This is not to state that the military was doing nothing in the area of chemical research and development; there was research being done, but quantitatively the dollar amount involved was quite small, approximately 1/1,000th of the military budget.[27d]

U.S. Policy

In general, the policy makers and national strategists alike were influenced by the policy on gas warfare formulated by President F. D. Roosevelt, which he expressed as: ". . . I have been loath to believe that any nation, even our present enemies, could or would be willing to loose upon mankind such terrible and inhumane weapons. . . . use of such weapons has been outlawed by the general opinion of civilized mankind. This country has not used them and I hope that we will never be compelled to use them. I state categorically that we shall under no circumstances resort to the use of such weapons unless they are first used by our enemies. . . ."[23] Consequently, decision makers were not willing to expend the needed resources in the development of a weapons capability that had such a remote chance of becoming part of the nation's arsenal. This policy and belief was not without its opponents. Many of the nation's advanced thinkers were openly concerned that the evolutionary and revolutionary forces at work throughout the world had invalidated past judgments. They argued that history had shown many times that a powerful nation could not retain its position by continuing to rely on outmoded concepts.[9] Moreover, they believed that not even a strong economy could win a war from a standing start, when new weapons were available but were not in our inventory.[23] In simpler terms, it is the weapons in being that count the most.

During the 1950s the Roosevelt policy was attacked on its two principal premises. First, chemical warfare is "inhumane." It was argued that psychochemicals could offer a ray of hope for a more "humane" weapons system; that is to say, an enemy could be temporarily incapacitated without harming the surrounding population or industrial capability.[8,10] Secondly, it was argued that if the communists succeeded in attaining a superiority in new chemical and biological weapons which we could not match or which we could not defend against, we would forfeit the option of retaliation.[11,12,15]

The merits of the arguments on either side are not important to this report, however, the fact that such controversy existed at the time is important.

Although research and development in chemical warfare to include the use of human volunteers was authorized and conducted during the 1950s, the public apparently was unaware of either the extent of the Army's research effort or of the capabilities of their potential enemies. Moreover, prior to the late 1950s (1957-1959) there is evidence of only minimal efforts on the part of the military to provide the Congress substantial information regarding chemical warfare research from both the offensive and defensive standpoint.[27] The mass of data reviewed in the preparation of this report indicated that secrecy was maintained for three primary reasons: First, the lack of definite knowledge of exactly what our enemies already knew or had in their own arsenals; second, the natural revulsion against the effects of both old and new CBR agents made them natural targets for international propaganda campaigns; and third, was the concern that the American people would express repugnance with the Army's involvement in this type of warfare preparation, rather than accepting the need for research, if for no other reason than to learn how to protect our population in the event of a chemical attack. This later perception was highlighted in a speech by a former deputy director of Defense Research and Engineering in 1959 when he said: "At

> the present time I might say the Soviet Union seems to be ahead of us in the field of chemical and biological weapons for military use, as well as in the field of civil defense against these weapons. The apparent American reluctance to think about and face up to the realities and potentialities of biological and chemical weapons might give an enemy an absolutely crucial military advantage over us, unless we take steps immediately to rectify our military and civil defense posture, vis-a-vis the biological and chemical weapons capabilities of our potential enemies. . . ."[12]

Serious open acknowledgement of America's chemical/biological civil defense readiness appeared to come into focus in 1958. The suddenness with which ample file documents and public literature appeared leads to a conclusion that the opponents of secrecy had been struggling for some time to present their case to Congress and the general public. Their motivation seemed to stem from concern for the public welfare and a desire to influence a more flexible national policy. In early 1958 the Chief of the Army Chemical Corps offered that since 1948 U.S. national policy had been based on nuclear deterrence. He stated that "the U.S. had been involved in 17 wars during that ten-year period and won none of them, nor had nuclear weapons been used in any of them." In the meantime, he reported, communism had increased its geographical and population control by 600 percent. Moreover, he opined that psychochemicals and their non-lethal effects were ideal for Russian use against the United States because they would allow for the capture of undamaged American industry and the manpower resources to operate it.[14] His theme was adopted by many scientists, legislators, and military planners.[13] In late 1958 the new Chief of the Army Chemical Corps promoted the "Blue Sky Program," which was designed to seek new and novel ideas from chemists throughout the nation. Eight months later the U.S. Army Chemical Corps Advisory Council (an assemblage of some of the nation's leading scientists) reported that the U.S. was seriously lagging behind the USSR in chemical warfare readiness. They reported: that the USSR was prepared for large-scale chemical and biological warfare, both overtly and covertly; USSR chemical agent production schedule was three or four times that of the U.S.; the USSR had started production of V-agents in 1956 while the U.S. would not start until 1960; the USSR started production of G-agents in 1947 and the U.S. started in 1954; Russia had stockpiled 215,000 tons of chemical agents as compared to 31,000 tons by the U.S.; and Russia's chemical service employed 100,000 men while the U.S. had 5,000. Furthermore, the Council found that the USSR had a decided advantage because the U.S. and its allies had little or no chemical/biological defense system.[17]

Those findings were reinforced by the results of a Booz-Allen Applied Research, Inc., research project which had been contracted to determine the extent of USSR efforts in chemical and biological warfare and the U.S. defenses against that type warfare. Booz-Allen reported that the

USSR was concerned with CB warfare and it could be their future prime effort. Another finding was that the U.S. was without effective CB countermeasures or alert system. Additionally, they found that the research required to correct the deficiency was not being conducted.

CBR Research

During this period the need for more research was often the subject of major news articles: The Army Information Digest published Attack by Invisible Invader;[8] U.S. News and World Report published New Worry for World;[9] The Reporter published The Campaign to Make Chemical Warfare Respectable;[16] the Baltimore Sunday American and News Post published a series of four articles entitled Plan to Alert Nation on Invisible Death, US Wide Open to a Surprise Gas-Germ Raid, Gas, Biological Warfare Threat to U.S. Now, and U.S. Has Few Ways to Spot Cloud of Death;[18] and the Readers Digest Association, Inc., published Let's Face the Truth About Gas and Germ Weapons.[20] These are a small sampling of the material published on the subject. The theme generally was the same; the Russians were ready and willing to conduct CB warfare and the U.S. was not, thus, national security was in jeopardy. The Congress, both the House and Senate, conducted hearings at the committee level on this subject. The House of Representatives subcommittee on appropriations received testimony regarding chemical and biological research and related matters in March 1958, April 1959, March 1960, March 1961, and March 1962. The House Committee on Science and Astronautics received extensive testimony in January 1959 and submitted a comprehensive report to the House of Representatives titled: Research in CBR (Chemical, Biological and Radiological Warfare).[23] The recommendations offered by this committee in their report appeared to represent the culmination of a decade of salesmanship efforts by the chiefs of the Chemical Corps and their supporters; therefore, they bear repeating in this report. The report concluded:

> As a result of its hearing and further study on the problems of research in CBR, this committee offers the following recommendations:
>
> (1) There must be a strong and continuous intelligence effort conducted by the United States as a protective measure to keep abreast of foreign developments in the fields of CBR if this country is to have time to develop adequate passive defense and other countermeasures.
>
> (2) Surveillance of foreign activities might also give this nation its only inkling of imminent use of CBR against the United States, and therefore is important for this reason too.

(3) There is an urgent need for greater public understanding of the dangers and uses of CBR if proper support is to be given to our defenses and countermeasures.

(4) In any consideration of international disarmament, a special effort must be made not to overlook the great potential of CBR and the ease of evading detection of CBR activities.

(5) There is an urgent need for higher level of support on a continuing, long run basis in order to develop better detection and protection measures against possible employment of CBR against this country.

(6) Civil defense plans of this country should include a more positive effort at providing shelters which are proof against CBR attack, at providing more masks and protective clothing, and in public instruction in defensive measures.

(7) More positive and imaginative attention should be given to the problems of detecting and guarding against use of CBR by saboteurs aimed at disrupting key activities in time of emergency.

(8) The committee views CBR as a weapon which is not competitive with nuclear weapons, but complementary to them, designed to do a different job.

(9) The committee cannot bring itself to describe any weapon of war as "humane," and makes no moral judgment on the possible use of CBR in warfare. It does recognize that ignoring CBR will not remove the problem of its existence or its possible employment against the United States.

(10) It is granted that some forms of CBR offer the prospect and the hope of winning battles without taking human life or destroying homes and factories. If force must be used, this is better than many of the alternatives. But it must also be recognized that even if the US is attacked with the new "gentle" weapons, the consequences of any defeat for our nation would be just as dangerous to our national goals and life.

(11) It is also recognized that in the present world situation with other countries pursuing vigorous programs of CBR development, the best immediate guarantee the US can possess to insure that CBR is not used anywhere against the free world is to have

a strong capability in this field, too. This will only come with a stronger program of research.

(12) At the present time, CBR research is supported at a level equivalent to only one one-thousandth of our total defense budget. In light of its potentialities, this committee recommends that serious consideration be given to the request of Defense officials that this support be at least trebled. Only an increase of such size is likely to speed research to a level of attainment compatible with the efforts of the communist nations.

(13) If CBR is to be considered a deterrent force in the US arsenal of weapons, the program of research advocated here will have to be accompanied by an adequate program of manufacture and deployment of CBR munitions.

(14) CBR warfare is not particularly expensive as compared with many other modern forms of warfare, particularly when considered as an incremental cost added to already necessary delivery techniques employed for nuclear weapons. This is a further reason why this investment must be given careful consideration.

(15) The research being done in CBR has already yielded a variety of peacetime benefits, including antidotes for poisons, new serums to prevent disease, greater understanding of how diseases are spread, new insecticides, and fundamental knowledge of life processes. There is no real separation possible between potential military application of chemical and biological knowledge and peaceful applications. These peaceful applications are required in any case and deserve added support for the national welfare.

(16) The United States is in a research and development race, particularly with the Soviet Union, whether it be for peaceful or military purposes. The study by this committee of CBR reinforces our general view of the urgency of the overall race and necessity of full public understanding and support of science and technology everywhere in our nation.

The Senate Armed Services Committee, in its February 1962 hearing, considered many of the same aspects as the House had two years earlier.

It is important to note that Defense officials and Congress were not alone in their concern for improved CBR research and public awareness of the threat. In October 1959 the American Legion adopted a resolution to achieve an impressive military capability in CBR warfare. Also in October 1959, the American Chemical Society Board Committee on Civil Defense published a finding that declared the US was following a CBR policy of "Head in the Sand." They went on to claim that the American people were uninformed as to the dangers of chemical attack, that there was a lack of CBR deterrent weaponry. The American Chemical Society, with 88,000 members, was often credited by the news media with removal of the lid of secrecy that surrounded the need for adequate CBR civil defense measures.[17] Unquestionably, the American people were beginning to get the word through the media, congressional hearings, defense public relations efforts and a wide variety of speeches to such assemblages as the Chemical Corps Protective Committee, the Robert A. Welch Foundation, American Chemical Society, Armed Forces Chemical Association, Compressed Gas Association, Office of Defense Mobilization, American Medical Association, and the American Ordnance Association. The messages they received were similar: the U.S. was not ready to defend itself against a chemical warfare attack; the fear of an exchange could inhibit the Soviets from using atomic weapons if other means could achieve their purpose; Soviet planners were quoted as saying, "in the future, war will be distinguished from all past wars in connection with mass employment of Air Force devices, rocket weapons and varius means of destruction, such as atomic, hydrogen, chemical and bacteriological weapons"; Soviet forces, with 175 ready divisions, had chemical troops at all echelons and were prepared to participate in large-scale gas warfare; and Major General Drugov of the Soviet Army was quoted as saying, "special interest attaches itself to the so-called psychic poisons (mescaline, methedrine, and lysergic acid derivatives) which are now used for simulation of mental disease."[23] The speeches also contained such alarming statements as: any major military power can manufacture nerve gas or a comparable material at the rate of hundreds of tons per day; the American civil population is without protective masks or training in their use; America cannot afford to ignore the real possibility that even more powerful chemical weapons than nerve gases remain to be discovered; and America may not know the type of chemical warfare agent an enemy may choose to employ on our forces until we are on the battlefield, thus our research must be complete.[19,21,22]

New Policy

A change in policy regarding chemical warfare appeared inevitable by the time President Kennedy took office. The Kennedy administration asked for a wider choice of responses shortly after taking office and Defense research and development officials turned their efforts toward a "Balanced Arsenal--Balanced Power" effort.[21] With this new policy came the proliferation of chemical research and development to address both the offensive and defensive needs of our national security.

FOOTNOTES

CHAPTER III

1. Notes of Joint Intelligence Council Meeting, 1952.

2. Chemical Corps Protective Committee Report, March 1959.

3. U.S. Army Chemical Corps Advisory Council Report, July 1959.

4. Speech to Robert A. Welch Foundation by MG Stubbs, 20 January 1961.

5. Intelligence Branch Study on Policy and Trends in USSR with Respect to Offensive Chemical Warfare, 1 January 1955.

6. Intelligence Branch Study of Chemical Warfare, Office of Chief Chemical Officer, Department of the Army, November 1954.

7. Ad Hoc Advisory Committee of Chemical Corps Mission and Structure (Miller Report), August 1955.

8. Army Information Digest, "Attack by Invisible Invader," by MG Creasy, February 1958.

9. U.S. News and World Report article, "New Worry for World," May 1958.

10. Text of speech, "CBR Warfare in Focus," by MG Creasy.

11. Same as Footnote 22.

12. Speech titled, "This is the CW Threat," by Dr. William H. Summerson, 8 April 1960.

13. U.S. Senate, Congressional Record, remarks by Honorable Alexander Wiley of Wisconsin, 30 January 1958.

14. Remarks to Compressed Gas Association titled, "Should We Worry About C&B Warfare," by MG Creasy, January 1958.

15. Remarks to Armed Forces Chemical Association by MG Stubbs titled, "CBR A Power for Peace," April 1959.

16. Article by The Reporter titled, "The Campaign to Make Chemical Warfare Respectable," October 1959.

17. Report by American Chemical Society, Board Committee on Civil Defense, 19 October 1959.

18. Series of articles by Baltimore Sunday American and News Post titled, "Plan to Alert Nation on Invisible Death"; "U.S. Wide Open to a Surprise Gas-Germ Raid"; "Gas, Biological Warfare Threat to U.S. Now"; and "U.S. Has Few Ways to Spot Cloud of Death," January 1960.

19. Speech to American Medical Association titled, "Medical Importance of CBR Warfare," by LTG Heaton, The Surgeon General of the Army, 30 June 1960.

20. Readers Digest article, "Let's Face the Truth About Gas and Germ Weapons," August 1960.

21. Speech to Armed Forces Association, "Balanced Arsenal-Balanced Power," by MG Stubbs, September 1961.

22. Speech to American Chemical Society, "This is the New CBR Perspective," by MG Stubbs, 8 April 1960.

23. House Report #815, The Committee of Science and Astronautics, The House of Representatives, The Congress of the U.S., 86th Congress, 1st Session.

24. Intelligence Staff Study, "Soviet R&D Capability for Toxic Agents," July 1958.

25. Office of Scientific Intelligence, CIA report on "Soviet Efforts to Develop New Chemical Warfare Toxic Agents," October 1960.

26. Meeting Notes of the American Chemical Society, "History of Chemical Corps," 19-20 May 1958.

27. Congressional record of testimony:

House of Representatives:
a. Subcommittee on Appropriations, 86th Congress, March 1960.
b. Appropriations Committee, 87th Congress, March 1962.
c. Appropriations Committee, 85th Congress, March 1958.
d. Appropriations Committee, 86th Congress, April 1959.
e. Appropriations Committee, 87th Congress, March 1961.
f. Science and Astronautics Committee, 86th Congress, June 1959.
g. Foreign Affairs Committee Report, May 1970.

Senate:
h. Armed Services Committee, 87th Congress, February 1962.
i. Foreign Relations Committee, 91st Congress, April 1969.

CHAPTER IV

THE DERIVATION OF AUTHORITY

General

The purpose of this chapter is to present the authority for the conduct of chemical warfare research with human subjects; to describe the procedures that governed the conduct of research with humans; and to discuss the interpretations of authority for the conduct of incapacitating agent research which existed at the time.

This chapter will cover the origins of medical research restrictions for the Army. It also covers the extremely high level at which decisions were made and the lengthy and thorough staffing that preceded the granting of authority to use human volunteers in research. Finally, it will include discussion of the several occasions when research was conducted without proper authority or when authority was incorrectly granted.

Chemical Corps Medical Research and the Use of Human Subjects

Just as in the history of medicine, human experimentation appears to have been an integral part of the history of the U.S. Army chemical warfare research efforts. On 28 June 1918 the President of the United States directed the organization of the Chemical Warfare Service (CWS), National Army, under the Secretary of War.[1] The CWS was created by merging the Chemical Service Section, National Army, the Chemical Element of the Ordnance Department, and the Sanitary Corps of the Medical Department. Four years later, in October 1922, the CWS created a Medical Research Division to conduct research directed at providing a defense against chemical agents.[2] Part of the defense was the provision of therapeutic and prophylactic measures. The scientists apparently shared a common belief that no matter how exhaustively an agent was tested in animals, if it was intended to protect or heal man, its efficacy had to be proved in man.

The scant evidence available for this period indicated that for the next 19 years the subjects used in various tests of mustard, phosgene, and many other chemical agents were volunteer employees of Edgewood Arsenal.[3] This expedient arrangement reportedly sufficed because the experimental staff was too small to generate experiments requiring large numbers of human subjects. However, available documents reflected that in early 1941 the threat of war caused greater urgency for the development of protective items. Consequently, the need for a larger source of volunteers also developed. The first recorded recruiting arrangement was a request made to all technical and officer personnel at Edgewood Arsenal to signify their willingness to participate in various tests; a method which was soon reported as unsatisfactory.[3] Generally, it was considered that repeated exposure to agents was hazardous because the cumulative effects of the compounds were not known; sensitizing employees to compounds they had to work with in the course of their normal duties basically was unproductive; many of the volunteers because of their technical qualifications had preconceived opinions as to the reactions they should have to certain agents and thus were not completely objective or unbiased in their reporting; test results were subject to invalidation due to the lack of testing on a valid random population basis; and a concern that the fear of censure by co-workers motivated many of the volunteers.

This period was characterized by an absence of any evidence which would indicate who authorized the use of human volunteers, or if it was a point of concern. It was apparent that if a source of authority did exist, it probably was informal and rested with the local commander. The first indication of formal authority to recruit and use volunteer subjects in chemical warfare experiments was in 1942. Specifically, in June 1942 records reflected that the Secretary of War was requested to rule on the permissibility of using enlisted men for detail testing of mustard type agents. Reportedly, the Acting Secretary approved the test in principle and authorization was granted by The Adjutant General of the Army in the name of the Secretary.[5] This authority was followed by large-scale human experimentation at Edgewood Arsenal, as well as at field laboratories located at Camp Siebert, AL, Bushnell, FL, Dugway Proving Ground, UT, and San Jose Island. The testing programs continued throughout the war years. It also was reported that this authority was not rescinded. Subsequently, during the early 1950s this original authorization was again used for the conduct of tests at Dugway Proving Ground which involved exposing human volunteers to mustard type agents.[4] It must be noted that the evidence concerning tests involving mustard agents following World War II was a single documentary reference, uncorroborated by any other evidence.

In July 1943 the Chemical Warfare Service (CWS) was assigned responsibility for all medical research involved in the field of chemical warfare. This adjunct to the CWS mission included toxicological research and the investigation and study of hazards to the health of Chemical Warfare Service personnel.[5] With the end of World War II the immediate requirement for volunteers temporarily was diminished. There were indications that the laboratories at Edgewood Arsenal reverted to the old practice of using local assigned personnel to meet their volunteer needs. This does not imply that the end of World War II curtailed the research activity of the Chemical Corps. On the contrary, the frightening revelation that Germany had stockpiled certain organic phosphate compounds (nerve gases) that were far more deadly than the chemical agents in the Allied arsenal, developed a new series of challenges for the Corps. Discovering methods to counteract the lethal effects of these compounds became a primary goal of medical research. However, American researchers were unable to locate any usable research evidence that the Germans had conducted meaningful human experimentations with the nerve agents. Thus it was necessary to spend the next several years confirming German research data by animal experimentation and by compiling sufficient information to determine the safe experimental dose for man.[3] When the necessary animal experiments had been concluded and the Chemical Corps investigators were confident of their ability to safely conduct experiments in man, the question again surfaced as to where the volunteers would come from.

Authority to Use Volunteers

During this period, the rules governing the use of humans had undergone major changes. The first of these changes was the Nuremberg Military Tribunals, following World War II, which produced a set of firm rules for the conduct of medical research. They were known as the "Nuremberg Code of 1947," and it established 10 specific rules intended to govern the use of humans in the conduct of medical experimentation.[6] Since this Code became the foundation for future guidance to researchers, its essential elements are repeated in this report:

> 1. The voluntary consent of the human subject is absolutely essential. This means that the person involved should have legal capacity to give consent; should be so situated as to be able to exercise free power of choice, without the intervention of any element of force, fraud, deceit, duress, overreaching or other ulterior form of constraint or coercion; and should have sufficient knowledge and comprehension of the elements of the subject matter involved so as to enable him to make an understanding and enlightened decision. This latter element requires that before the acceptance of an affirmative decision by the subject there should be made known to him the nature, duration and purpose of the experiment; the method and means by which it is to be conducted; all inconveniences and hazards reasonably to be expected; and the effects upon his health or person which may possibly come from his participation in the experiment. The duty and responsibility for ascertaining the quality of the consent rests with each individual who initiates, directs or engages in the experiment. It is a personal duty and responsibility which may not be delegated to another with impunity.

2. The experiment should be such as to yield fruitful results for the good of society, unprocurable by other methods or means of study, and not random and unnecessary in nature.

3. The experiment should be so designed and based on the results of animal experimentation and a knowledge of the natural history of the disease or other problems under study that the anticipated results will justify the performance of the experiment.

4. The experiment should be so conducted as to avoid all unnecessary physical and mental suffering and injury.

5. No experiment should be conducted where there is an a priori reason to believe that death or disabling injury will occur; except, perhaps, in those experiments where the experimental physicians also serve as subjects.

6. The degree of risk to be taken should never exceed that determined by the humanitarian importance of the problem to be solved by the experiment.

7. Proper preparations should be made and adequate facilities provided to protect the experimental subject against even the remote possibilities of injury, disability or death.

8. The experiment should be conducted only by scientifically qualified persons. The highest degree of skill and care should be required through all stages of the experiment of those who conduct or engage in the experiment.

9. During the course of the experiment the human subject should be at liberty to bring the experiment to an end if he has reached the physical or mental state where continuation of the experiment seems to him to be impossible.

10. During the course of the experiment the scientist in charge must be prepared to terminate the experiment at any stage, if he has probable cause to believe, in the exercise of the good faith, superior skill, and careful judgment required of him that a continuation of the experiment is likely to result in injury, disability, or death to the subject.

The second major change occurred in 1950, with the introduction of legislation governing the organization of the U.S. Army. The initial statutory authority for the Army to conduct research and development was housed in the Organization of the Army Act of 10 July 1950. Section 104 of the Act

(74 Statute 322; 5 USC 235a) held that: "The Secretary of the Army is authorized to conduct, engage, and participate in research and development programs related to activities of the Army of the United States and to procure; or contract for the use of, such facilities, equipment, services, and supplies as may be required to effectuate such programs."[7] It appears that this was the first time the Congress placed into law control over research and development activities and further vested the responsibility and authority for such programs with the service secretary. It further appears from this Act that the Congress recognized research and development functions as an integral part of the Army's role.

At this point in history there are two separate, yet related, actions impacting on research: the Nuremberg Code of 1947 and the Organization of the Army Act of 1950. Although there is little in the way of documentary evidence to indicate general knowledge or recognition of the impact of these actions, it does appear that authority for future use of humans in research would require observance of the Nuremberg Code and also would require authorization by the service secretary. However, no documentary evidence was discovered which indicated that the secretary either delegated his authority or established directives or guidelines to preclude research involving human subjects without his authorization. In fact, there was a notable lack of policy one way or the other between 1950 and 1952.

Early Policy Guidance

The matter of the use of human volunteers was under deliberate consideration by the Armed Forces Medical Policy Council during the first two years of the 1950s. In the fall of 1952, following extensive study, the Council reported to the Secretary of Defense that researchers had reached the point beyond which essential data could not be obtained unless human volunteers were utilized. Thus, they recommended that the Secretary of Defense establish a policy that would authorize the use of humans in medical research.[8] They further recommended that the Nuremberg Code of 1947 be cited as the principal guidance to the services. However, they urged that three articles of the Code be modified. The first of these recommended modifications was that Article 1 require the volunteer's consent to be in writing and his signature witnessed. Secondly, they recommended that Article 5 be modified to delete the final phrase "except, perhaps, in those experiments where the experimental physicians also serve as subjects," thereby leaving the entire article to read: "No experiment should be conducted where there is an a priori reason to believe that death or disabling injury will occur." Finally, they suggested that an additional rule be added which would prohibit the use of prisoners of war as volunteer subjects.

Based upon a recommendation of the Armed Forces Medical Policy Council that human subjects be employed as the only feasible means for realistic evaluations and/or development of effective preventive measures of defense against atomic, biological, or chemical agents, the Secretary of Defense, by a memorandum to the service secretaries, established a policy governing the use of human volunteers. The memorandum, dated 26 February 1953, was classified "TOP SECRET" and provided the following: each service secretary was authorized to use human volunteers in experimental research connected with the development of defenses of all types against atomic, biological and/or chemical warfare agents; provided specific guidance and safeguards concerning the use of human volunteers, which included the rules as set forth in the Nuremberg Code, as modified by the Armed Forces Medical Policy Council; required that in each instance in which an experiment was proposed pursuant to the memorandum that the nature and purpose of the proposed experiment (protocol) and the name of the person to be in charge of the experiment shall be submitted for approval of the service secretary; required that the service secretary approve, in writing, the proposed experiment and the person to be in charge of the experiment; and required the service secretary to inform the Secretary of Defense of each approved research proposal.[8]

Although there was no evidence that the Chemical Corps Research Laboratories were provided advance information concerning the forthcoming guidance on the use of human volunteers in research, there was evidence that the underlying principles of the "Wilson Memorandum" were known and were the subject of detailed discussions long before Department of the Army published an implementing directive. In this regard, the Medical and Related Problems Committee of the Chemical Corps Advisory Council met at the Army Chemical Center (now Edgewood Arsenal), on 20-21 March 1953, to discuss the impact and implementation of the rules established at the Nuremberg Trials and accepted in modified form by the Secretary of Defense in February 1953. In attendance at this meeting were the prominent civilian doctors who constituted the committee, legal and medical advisors to the Chief, Chemical Corps, representatives from the medical and biological laboratories, and representatives of intermediate chemical research commands.[4] The report of this meeting was significant because it indicated the existence and use of an alternate to normal command channels for the dissemination of Army policy within the Chemical Corps. Although the "Wilson Memorandum" was dated 26 February 1953, the Army's implementing instructions to that memorandum had not been published or announced at the time of the conference. Nevertheless, the Council, in anticipation of an Army policy, advanced local interpretations that later would be germane in the execution of the policy. The depth of knowledge held by the participants regarding problems associated with the use of humans in research is probably best explained by recognizing the key positions they occupied in the Chemical Corps organization and, in some instances, overlapping membership in other advisory councils within the armed forces. Some of their interpretative conclusions are worthy of mention at this point, even though most will be discussed later in this and subsequent chapters. They concluded that it was important to differentiate between hazardous and nonhazardous experiments. In their opinion this differentiation was essential since they agreed that only protocols for hazardous experiments need be submitted for approval. In this light, they reported that gas mask training during which men passed through a chamber with a high concentration of mustard gas would be considered nonhazardous and "in the line of duty." Another consideration was an effort to seek blanket type approval for experiments already being conducted, thus simplifying an anticipated problem of obtaining approval for specific hazardous experiments. The participants agreed that the most controversial legal aspect was to determine what constituted voluntary consent. The conferees noted that the important considerations in this regard were: the age of the volunteer; mental capacity; and the amount of information which must be provided in advance of obtaining the signed volunteer statement. Additionally, it was opined that any form of coercion, mental, physical, or material, must be avoided. Further, they considered military volunteers as presenting a particularly sensitive problem since soldiers were imbued with a sense of obedience and readily could be placed in a position where the experiment was made to appear as a military duty and thus something the volunteer could not refuse.

Two months later, in May 1953, the Army Staff presented the Secretary of the Army with a proposed directive to implement the "Wilson Memorandum." Although the Secretary agreed in principle with the proposed instructions to the field, he rejected the initial proposal because it was restricted to biological agent research rather than chemical, biological, and radiological agents and because he believed that the "TOP SECRET" classification should be downgraded in order to make the instructions more readily available to subordinate elements that would be conducting the research. Evidence indicates that the first guidance to the Army Staff was published on 30 June 1953.[11] This memorandum, which was addressed through the Assistant Chief of Staff, G-4, to the Army Chief Chemical Officer and The Surgeon General, was titled: "Use of Volunteers in Research," and was to be referred to as "Chief of Staff Memorandum 385 (CS:385)." Its purpose was to provide policy and procedures for the use of volunteers in atomic, biological, and chemical research. In addition to transmitting the 11 rules contained in the "Wilson Memorandum" and legal considerations for researchers, it also directed that no research of atomic, biological, or chemical agents using volunteers would be conducted without the specific written approval of the Secretary of the Army. Moreover, it directed that proposals for such research would be forwarded to The Surgeon General of the Army for his review and mandatory comment prior to presentation to the Secretary for approval. The memorandum, as published, did not differentiate between hazardous and nonhazardous experiments as a consideration of whether to obtain Secretary of the Army approval, rather, it specified that all atomic, biological, and chemical agent experiments which used human subjects would be submitted. The document search failed to disclose